

CHAPTER 1

Total Energy Use

There are two
common ways to account
for energy use:

resource
energy consumption
and
end-use
energy consumption.

End-use refers to the energy content of electricity and other fuels at the point of use by customers. **Resource energy** includes all energy resources used to generate electricity, including the energy content of the coal, petroleum, nuclear and renewable fuels. Resource energy also includes the energy used to produce the electricity imported into Wisconsin from other states and Canada. Because about 70 percent of the energy used to generate and distribute electricity to its point of use is lost as waste heat, resource consumption figures are greater than end-use consumption figures.

Prior to 1997, petroleum was Wisconsin's leading energy source, but its share of resource energy use has fallen from a peak of 40 percent in 1977 to 26.0 percent in 2010. Coal is the leading resource energy source in Wisconsin, comprising 32.1 percent of all resource energy use. Coal surpassed natural gas as the state's second largest energy source in 1981, and in 1997 coal surpassed petroleum as the state's leading source of resource energy.

Renewables increased by 5.6 percent and comprises 5.2 percent of Wisconsin's overall use of resource energy consumption. This includes hydroelectric generation, solar (photovoltaic and solar thermal), biomass (e.g., wood and wood by-products), biogas (e.g., agricultural manure digesters, wastewater treatment plants, and landfill gas), and wind.

Nuclear power in Wisconsin is no longer owned by utilities, but by independent power producers who sell the power to customers in Wisconsin.

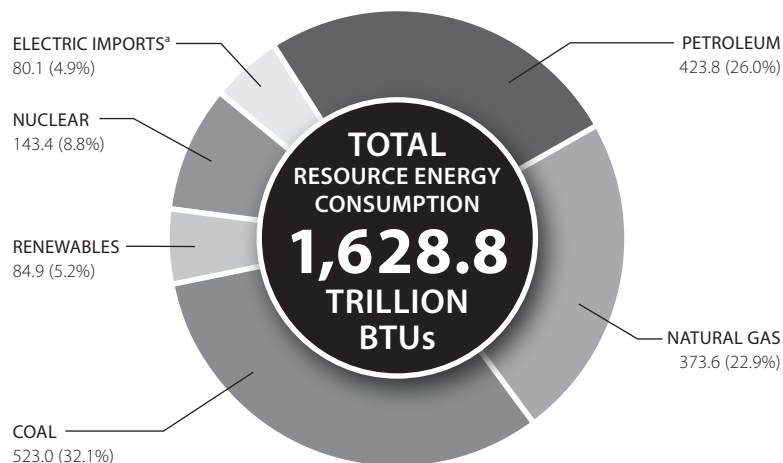
In general, the residential (25.5 percent) and industrial (27.4 percent) sectors each account for about one-quarter of Wisconsin's resource energy consumption. The transportation sector used 23.8 percent of the state's resource energy while the commercial and agricultural sectors accounted for 21.1 percent and 2.1 percent, respectively. In 2010, residential, commercial and agricultural end-use energy consumption decreased by 4.7, 5.9 and 11.6 percent respectively. Industrial and transportation end-use energy consumption increased by 2.2 and 3.7 percent respectively. Overall, end-use energy use decreased by 0.6 percent.

RESOURCE Energy Consumption	2010	Percent of Wisconsin's Resource Energy Consumption
Resource Energy Consumption	▲ 0.8% overall	
BY FUEL		
Coal Consumption, Utilities	▲ 8.0%	32.1%
Petroleum Consumption	▲ 0.0%	26.0%
Natural Gas Consumption	▼ 4.4%	22.9%
Electricity Imports	▼ 18.7%	4.9%
Renewables	▲ 5.6%	5.2%
BY ECONOMIC SECTOR		
Transportation	▲ 3.7%	23.8%
Residential	▼ 1.3%	25.5%
Industrial	▲ 3.3%	27.4%
Commercial	▼ 1.8%	21.1%
Agricultural	▼ 7.7%	2.1%

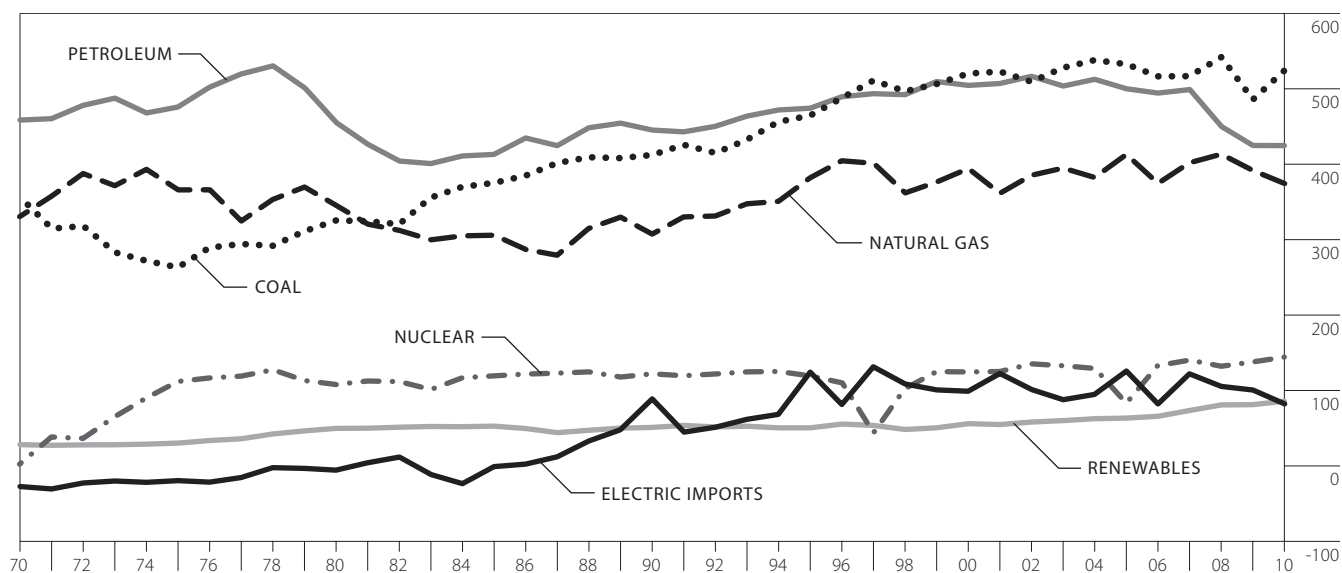
END-USE Energy Consumption	2010	Percent of Wisconsin's End-Use Energy Consumption
End-Use Energy Consumption	▼ 0.6% overall	
BY FUEL		
Petroleum Consumption	▲ 0.0%	38.3%
Natural Gas Consumption	▼ 5.4%	29.9%
Electricity Consumption	▲ 3.7%	21.2%
Renewables Consumption	▲ 3.5%	6.5%
Coal Consumption, Non-Utilities	▲ 2.9%	4.0%
BY ECONOMIC SECTOR		
Transportation	▲ 3.7%	35.1%
Industrial	▲ 2.2%	24.3%
Residential	▼ 4.7%	22.9%
Commercial	▼ 5.9%	15.6%
Agricultural	▼ 11.6%	2.1%

Wisconsin Resource Energy Consumption, by Type of Fuel

2010 TRILLIONS OF BTU AND PERCENT OF TOTAL



1970-2010 TRILLIONS OF BTU



^a "Electric imports" is the estimated resource energy used in other states or Canada to produce the electricity imported into Wisconsin. This resource energy is estimated assuming 11,300 Btu of resource energy per kWh imported into Wisconsin. Values below the "0" indicate that resource energy was used in Wisconsin to produce electricity that was exported out of state.

Source: Wisconsin State Energy Office

Wisconsin Resource Energy Consumption, by Type of Fuel

1970-2010 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Petroleum		Natural Gas		Coal ^a		Renewables ^b		Nuclear ^d		Electric Imports ^c		Total
1970	457.7	40.1%	327.4	28.7%	355.4	31.1%	27.3	2.4%	1.7	0.1%	-28.2	-2.5%	1,141.3
1975	475.0	38.8%	368.3	30.0%	262.3	21.4%	29.4	2.4%	111.2	9.1%	-20.4	-1.7%	1,225.8
1980 ^r	454.4	35.7%	344.0	27.0%	324.6	25.5%	48.9	3.8%	107.0	8.4%	-6.5	-0.5%	1,272.5
1985	412.0	32.7%	304.2	24.2%	374.4	29.7%	51.9	4.1%	118.6	9.4%	-1.8	-0.1%	1,259.3
1990	444.4	31.3%	306.4	21.6%	411.4	28.9%	50.2	3.5%	121.2	8.5%	87.7	6.2%	1,421.2
1995	473.4	29.4%	381.1	23.7%	463.7	28.8%	49.6	3.1%	118.5	7.4%	123.0	7.6%	1,609.2
1996 ^r	488.5	30.1%	403.7	24.9%	486.9	30.0%	54.6	3.4%	109.3	6.7%	80.2	4.9%	1,623.2
1997 ^r	492.7	30.3%	400.4	24.6%	510.1	31.3%	52.8	3.2%	42.3	2.6%	130.3	8.0%	1,628.7
1998 ^r	491.4	30.6%	361.0	22.5%	495.8	30.9%	47.4	3.0%	101.5	6.3%	107.7	6.7%	1,604.8
1999 ^r	508.6	30.6%	375.5	22.6%	505.5	30.4%	49.7	3.0%	124.1	7.5%	99.9	6.0%	1,663.4
2000 ^r	503.5	29.7%	393.3	23.2%	519.4	30.7%	55.1	3.3%	123.8	7.3%	98.1	5.8%	1,693.2
2001 ^r	505.9	30.0%	360.4	21.3%	521.9	30.9%	54.0	3.2%	124.3	7.4%	121.6	7.2%	1,688.2
2002 ^r	515.6	30.3%	384.5	22.6%	508.5	29.9%	57.3	3.4%	134.4	7.9%	100.4	5.9%	1,700.8
2003 ^r	502.7	29.5%	394.0	23.1%	527.0	31.0%	59.2	3.5%	132.0	7.8%	86.9	5.1%	1,701.8
2004 ^r	511.4	29.8%	381.5	22.3%	537.2	31.3%	61.7	3.6%	128.4	7.5%	94.0	5.5%	1,714.2
2005 ^r	499.2	29.2%	411.9	24.1%	531.7	31.1%	62.5	3.7%	81.8	4.8%	124.7	7.3%	1,711.9
2006 ^r	493.5	29.7%	373.5	22.5%	515.7	31.1%	64.9	3.9%	132.1	8.0%	81.0	4.9%	1,660.7
2007 ^r	498.1	28.5%	401.0	22.9%	515.9	29.5%	72.6	4.2%	139.4	8.0%	121.3	6.9%	1,748.3
2008 ^r	449.3	26.1%	412.4	24.0%	540.8	31.5%	80.0	4.7%	131.3	7.6%	104.7	6.1%	1,718.5
2009 ^r	423.9	26.2%	390.8	24.2%	484.5	30.0%	80.4	5.0%	137.0	8.5%	98.5	6.1%	1,615.2
2010 ^p	423.8	26.0%	373.6	22.9%	523.0	32.1%	84.9	5.2%	143.4	8.8%	80.1	4.9%	1,628.8

^a Including petroleum coke.

^b Renewables includes solar, wind, wood, biogas, biomass, ethanol and hydroelectric.

^c Electric imports are the estimated resource energy used in other states or Canada to produce the electricity imported into Wisconsin. This resource energy is estimated assuming 11,300 Btu of resource energy per kWh imported into Wisconsin. Negative percentages indicate that resource energy was used in Wisconsin to produce electricity that was exported out of state.

^d Nuclear energy reported here is from power plants formerly owned by Wisconsin utilities and currently owned by independent power producers.

^p Preliminary estimates.

^r Revised due to revisions in contributing tables.

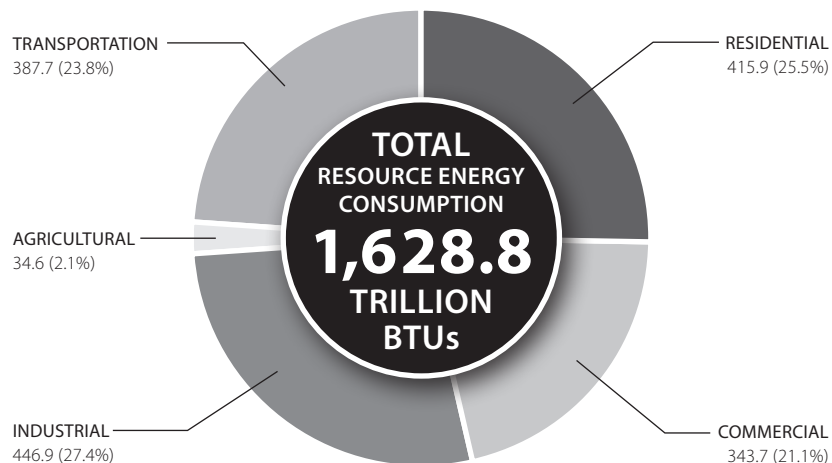
Source: Compiled from tables in this publication for Wisconsin petroleum, natural gas, coal, renewable resources and electricity use, by economic sector, and for Wisconsin electric utility energy use.

RESOURCE
ENERGY
CONSUMPTION
0.8%

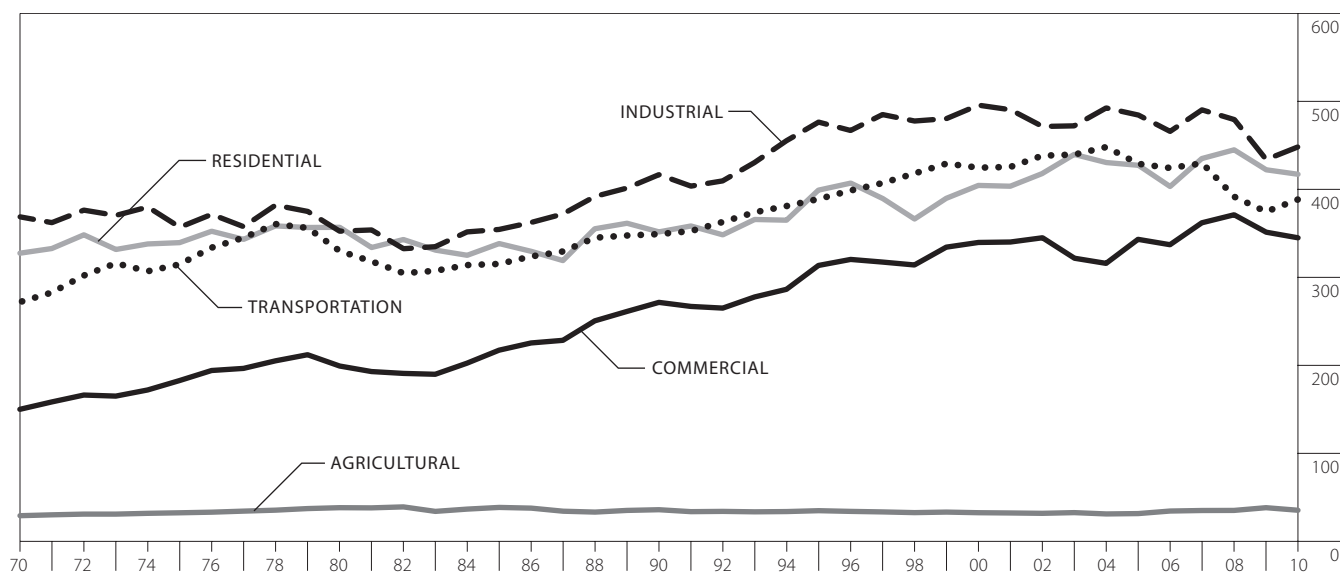
Resource energy consumption increased 0.8 percent in 2010. Petroleum consumption stayed level with 2009; natural gas, decreased 4.4 percent; coal, increased 8.0 percent; and renewables, increased 5.6 percent.

Wisconsin Resource Energy Consumption, by Economic Sector

2010 TRILLIONS OF BTU AND PERCENT OF TOTAL



1970-2010 TRILLIONS OF BTU



Source: Wisconsin State Energy Office.

Wisconsin Resource Energy Consumption, by Economic Sector

1970-2010 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Residential		Commercial		Industrial		Agricultural ^a		Transportation		Total
1970	324.3	28.4%	149.3	13.1%	368.0	32.2%	28.4	2.5%	271.2	23.8%	1,141.3
1975	341.9	27.9%	182.0	14.9%	356.1	29.1%	31.7	2.6%	314.0	25.6%	1,225.8
1980 ^r	355.6	27.9%	198.5	15.6%	351.7	27.6%	37.5	2.9%	329.2	25.9%	1,272.5
1985	336.8	26.7%	216.5	17.2%	353.7	28.1%	37.8	3.0%	314.5	25.0%	1,259.3
1990	350.9	24.7%	270.8	19.1%	416.0	29.3%	35.2	2.5%	348.4	24.5%	1,421.2
1995	398.4	24.8%	312.8	19.4%	475.6	29.6%	34.1	2.1%	388.3	24.1%	1,609.2
1996 ^p	406.3	25.0%	319.6	19.7%	466.1	28.7%	33.3	2.1%	397.9	24.5%	1,623.2
1997 ^r	388.8	23.9%	316.6	19.4%	484.2	29.7%	32.7	2.0%	406.4	25.0%	1,628.7
1998 ^r	365.4	22.8%	313.3	19.5%	476.9	29.7%	31.9	2.0%	417.3	26.0%	1,604.8
1999 ^r	389.1	23.4%	333.6	20.1%	479.6	28.8%	32.5	2.0%	428.5	25.8%	1,663.4
2000 ^r	403.7	23.8%	338.9	20.0%	494.9	29.2%	31.8	1.9%	423.9	25.0%	1,693.2
2001 ^r	402.8	23.9%	339.4	20.1%	489.7	29.0%	31.5	1.9%	424.7	25.2%	1,688.2
2002 ^r	417.3	24.5%	344.2	20.2%	470.7	27.7%	31.1	1.8%	437.5	25.7%	1,700.8
2003 ^r	438.9	25.8%	321.0	18.9%	471.4	27.7%	31.8	1.9%	438.8	25.8%	1,701.8
2004 ^r	429.7	25.1%	315.1	18.4%	491.7	28.7%	30.4	1.8%	447.3	26.1%	1,714.2
2005 ^r	426.6	24.9%	342.4	20.0%	483.7	28.3%	30.8	1.8%	428.3	25.0%	1,711.9
2006 ^r	402.3	24.2%	336.3	20.2%	465.0	28.0%	33.7	2.0%	423.5	25.5%	1,660.7
2007 ^r	434.4	24.8%	361.3	20.7%	489.6	28.0%	34.3	2.0%	428.8	24.5%	1,748.3
2008 ^r	444.2	25.8%	370.4	21.6%	478.6	27.9%	34.4	2.0%	390.9	22.7%	1,718.5
2009 ^r	421.2	26.1%	350.2	21.7%	432.5	26.8%	37.5	2.3%	373.8	23.1%	1,615.2
2010 ^p	415.9	25.5%	343.7	21.1%	446.9	27.4%	34.6	2.1%	387.7	23.8%	1,628.8

RESOURCE
ENERGY
CONSUMPTION
0.8%

Total resource energy consumption increased 0.8 percent in 2010.

The only increases were in the industrial and transportation sectors of 3.3 and 3.7 percent.

The other sectors saw decreases of 1.3 percent (Residential), 1.8 percent (Commercial), and 7.7 percent (Agriculture).

^a SEO discontinued a per-acre approach to gathering fuel data for the agriculture sector and substituted data from the Wisconsin Department of Revenue and from the federal National Agriculture Statistics Service (NASS). Data from NASS were not available previously.

^p Preliminary estimates.

^r Revised due to revisions in contributing tables.

Source: Compiled from tables in this publication for Wisconsin petroleum, natural gas, coal, renewable energy and electricity use, by economic sector, and for Wisconsin electric utility energy use.

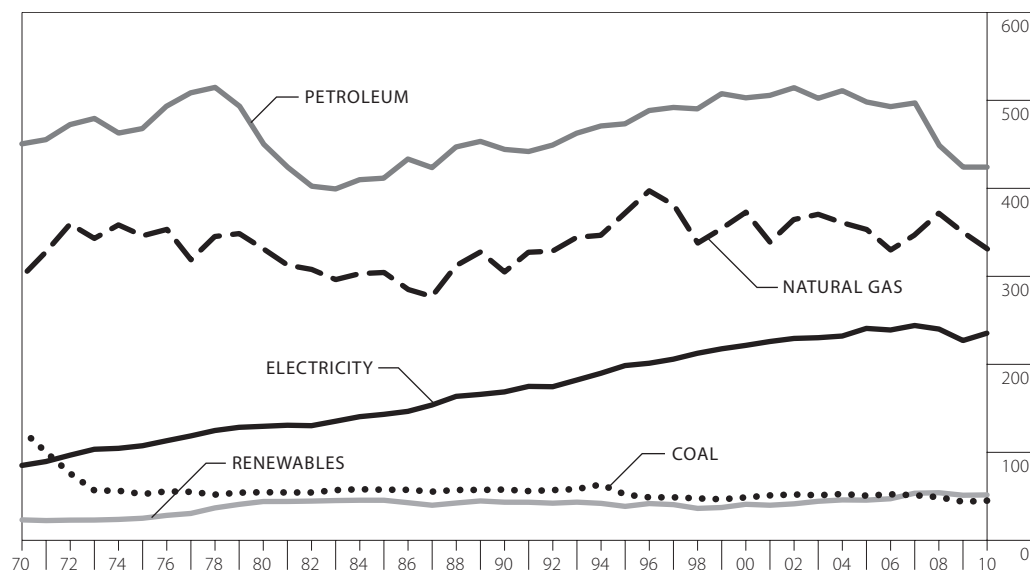
Wisconsin End-Use Energy Consumption, by Type of Fuel

**END-USE
ENERGY**
0.6%
IN 2010

End-use energy is a measure of the energy content of fuels at the point of consumption. Since much of the energy needed to generate electricity is lost in the generation process, end-use energy consumption figures will always be lower than the directly linked resource energy consumption figures.

End-use energy decreased 0.6 percent overall in 2010, after decreasing by 5.6 percent in 2009. Petroleum continues to be the most-used end-use energy source in Wisconsin (38.3 percent).

1970-2010 TRILLIONS OF BTU



1970-2010 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Petroleum		Natural Gas		Coal		Renewables		Electricity		Total
1970	449.8	46.0%	296.3	30.3%	124.3	12.7%	22.5	2.3%	84.4	8.6%	977.2
1975	467.2	46.8%	348.5	34.9%	51.8	5.2%	24.3	2.4%	106.7	10.7%	998.6
1980 ^r	449.6	44.7%	329.9	32.8%	53.9	5.4%	43.3	4.3%	128.8	12.8%	1,005.6
1985	410.7	42.9%	302.8	31.6%	56.7	5.9%	44.9	4.7%	142.4	14.9%	957.5
1990	443.4	43.7%	304.0	29.9%	56.9	5.6%	43.3	4.3%	167.9	16.5%	1,015.5
1995	472.5	41.7%	371.0	32.7%	51.3	4.5%	41.9	3.7%	197.8	17.4%	1,134.5
2000 ^r	501.9	42.1%	371.9	31.2%	48.0	4.0%	48.1	4.0%	220.8	18.5%	1,190.7
2001 ^r	504.6	43.3%	337.8	29.0%	50.3	4.3%	46.4	4.0%	225.2	19.3%	1,164.3
2002 ^r	513.5	42.6%	363.8	30.2%	51.3	4.3%	48.2	4.0%	228.7	19.0%	1,205.5
2003 ^r	501.5	41.7%	369.7	30.7%	50.5	4.2%	52.1	4.3%	229.5	19.1%	1,203.2
2004 ^r	509.9	42.2%	360.1	29.8%	51.9	4.3%	53.8	4.5%	231.4	19.2%	1,207.0
2005 ^r	497.4	41.6%	352.5	29.5%	50.0	4.2%	55.3	4.6%	240.1	20.1%	1,195.3
2006 ^r	492.1	42.1%	329.0	28.2%	51.6	4.4%	57.5	4.9%	238.3	20.4%	1,168.4
2007 ^r	496.2	41.3%	346.1	28.8%	50.5	4.2%	66.4	5.5%	243.4	20.2%	1,202.6
2008 ^r	448.2	38.0%	370.7	31.5%	48.2	4.1%	71.7	6.1%	239.3	20.3%	1,178.1
2009 ^r	423.4	38.1%	349.2	31.4%	43.1	3.9%	69.9	6.3%	226.2	20.3%	1,111.8
2010 ^p	423.3	38.3%	330.5	29.9%	44.3	4.0%	72.3	6.5%	234.7	21.2%	1,105.1

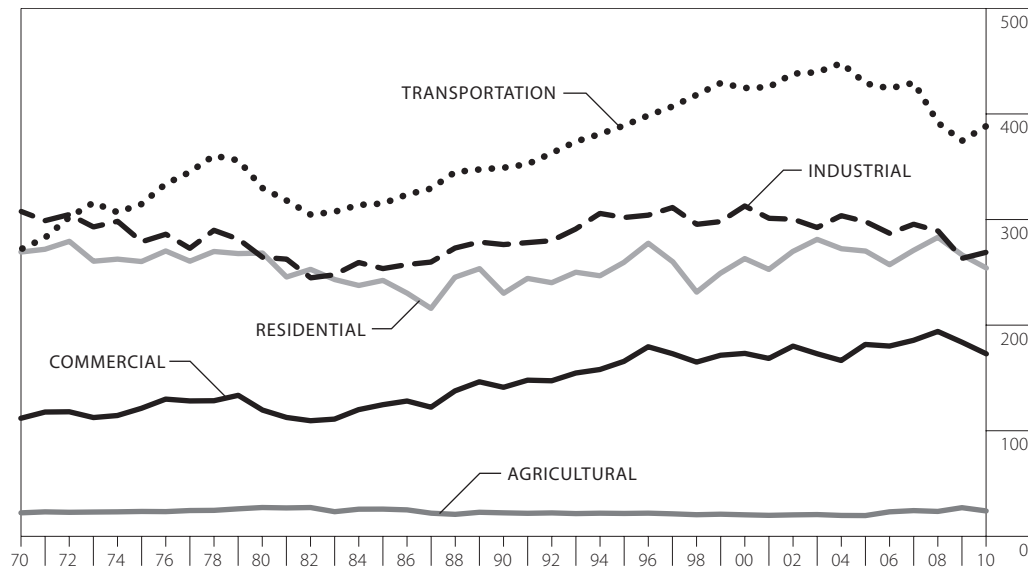
^p Preliminary estimates.

^r Revised due to revisions in contributing tables.

Source: Compiled from tables in this publication for Wisconsin petroleum, natural gas, coal, renewable and electricity use, by economic sector, and for Wisconsin electric utility energy use.

Wisconsin End-Use Energy Consumption, by Economic Sector

1970-2010 TRILLIONS OF BTU



**END-USE
ENERGY**
0.6%
IN 2010

End-use energy consumption decreased 0.6 percent in 2010. The transportation sector continues to be the largest consumer of end-use energy in Wisconsin (35.1 percent).

1970-2010 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Residential		Commercial		Industrial		Agricultural		Transportation		Total
1970	266.2	27.2%	111.2	11.4%	307.0	31.4%	21.6	2.2%	271.2	27.8%	977.2
1975	262.8	26.3%	120.6	12.1%	278.2	27.9%	22.9	2.3%	314.0	31.4%	998.6
1980 ^r	267.1	26.6%	119.0	11.8%	263.6	26.2%	26.7	2.7%	329.2	32.7%	1,005.6
1985	240.9	25.2%	124.0	13.0%	252.9	26.4%	25.2	2.6%	314.5	32.8%	957.5
1990	229.3	22.6%	140.4	13.8%	275.7	27.2%	21.6	2.1%	348.4	34.3%	1,015.5
1995	258.8	22.8%	165.1	14.6%	301.3	26.6%	21.0	1.9%	388.3	34.2%	1,134.5
2000 ^p	262.3	22.0%	172.6	14.5%	312.1	26.2%	19.7	1.7%	423.9	35.6%	1,190.7
2001 ^r	252.0	21.6%	167.8	14.4%	300.5	25.8%	19.2	1.7%	424.7	36.5%	1,164.3
2002 ^r	269.2	22.3%	179.4	14.9%	299.7	24.9%	19.7	1.6%	437.5	36.3%	1,205.5
2003 ^r	280.5	23.3%	172.2	14.3%	291.7	24.2%	20.0	1.7%	438.8	36.5%	1,203.2
2004 ^r	271.7	22.5%	165.8	13.7%	303.0	25.1%	19.2	1.6%	447.3	37.1%	1,207.0
2005 ^r	269.5	22.6%	181.1	15.1%	297.4	24.9%	19.0	1.6%	428.3	35.8%	1,195.3
2006 ^r	256.1	21.9%	179.6	15.4%	286.7	24.5%	22.6	1.9%	423.5	36.2%	1,168.4
2007 ^r	270.2	22.5%	185.0	15.4%	294.9	24.5%	23.7	2.0%	428.8	35.7%	1,202.6
2008 ^r	282.5	24.0%	193.3	16.4%	288.5	24.5%	23.0	1.9%	390.9	33.2%	1,178.1
2009 ^p	265.8	23.9%	183.1	16.5%	262.5	23.6%	26.5	2.4%	373.8	33.6%	1,111.8
2010 ^p	253.5	22.9%	172.2	15.6%	268.3	24.3%	23.4	2.1%	387.7	35.1%	1,105.1

p Preliminary estimates.

r Revised due to revisions in contributing tables.

Source: Compiled from tables in this publication for Wisconsin petroleum, natural gas, coal, renewable energy and electricity use, by economic sector, and for Wisconsin electric utility energy use.

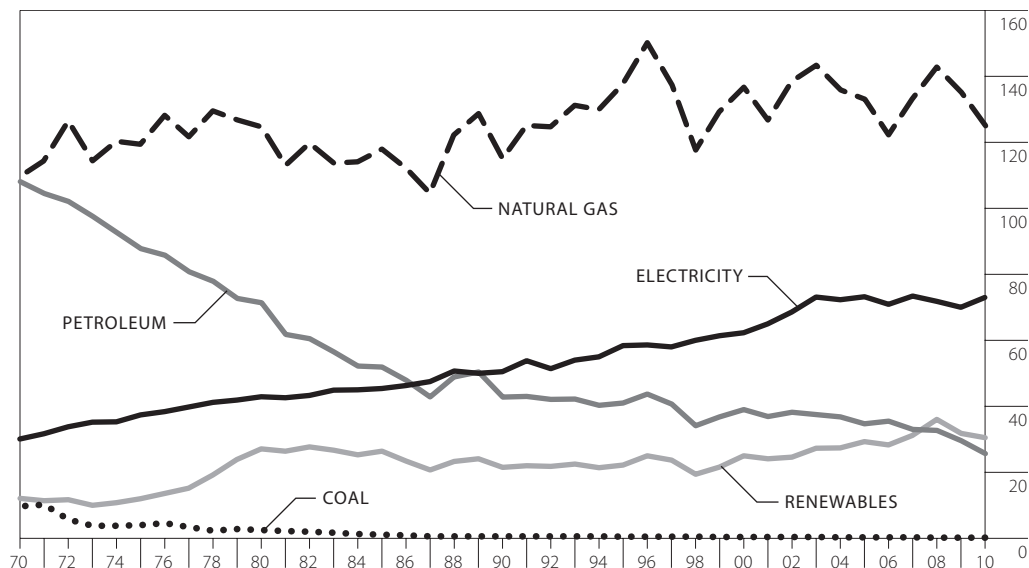
Wisconsin Residential Energy Use, by Type of Fuel

**RESIDENTIAL
END-USE
ENERGY
4.7%
IN 2010**

Residential end-use energy decreased 4.7 percent in 2010. Natural gas continues to be the dominant fuel used in Wisconsin homes (49.3 percent), comprising just under half of the end-use energy used.

Electricity consumption increased 4.2 percent from 2009, while petroleum use decreased by 13.2 percent and natural gas use decreased 7.5 percent. Between 1970 and 2010, petroleum use in the residential sector declined 76.4 percent.

1970-2010 TRILLIONS OF BTU



1970-2010 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Petroleum		Natural Gas		Coal		Renewables ^a		Electricity		Total End Use	Total Resource ^b
1970	107.9	40.5%	107.0	40.2%	9.5	3.6%	11.9	4.5%	29.9	11.2%	266.2	324.3
1975	87.6	33.3%	122.4	46.6%	3.8	1.4%	11.8	4.5%	37.2	14.1%	262.8	341.9
1980 ^r	71.2	26.7%	124.0	46.4%	2.3	0.9%	26.9	10.1%	42.7	16.0%	267.1	355.6
1985	51.7	21.4%	116.9	48.5%	0.9	0.4%	26.2	10.9%	45.2	18.8%	240.9	336.8
1990	42.6	18.6%	114.7	50.0%	0.4	0.2%	21.3	9.3%	50.3	21.9%	229.3	350.9
1995	40.8	15.8%	137.5	53.1%	0.3	0.1%	22.0	8.5%	58.2	22.5%	258.8	398.4
2000 ^r	38.8	14.8%	136.4	52.0%	0.2	0.1%	24.8	9.5%	62.1	23.7%	262.3	403.7
2005 ^r	34.5	12.8%	132.9	49.3%	0.1	0.0%	29.1	10.8%	73.0	27.1%	269.5	426.6
2006 ^r	35.3	13.8%	121.9	47.6%	0.1	0.0%	28.1	11.0%	70.7	27.6%	256.1	402.3
2007 ^r	32.8	12.2%	133.0	49.2%	0.1	0.0%	31.0	11.5%	73.2	27.1%	270.2	434.4
2008 ^r	32.5	11.5%	142.5	50.5%	0.0	0.0%	35.8	12.7%	71.6	25.4%	282.5	444.2
2009 ^r	29.4	11.1%	135.0	50.8%	0.0	0.0%	31.6	11.9%	69.8	26.3%	265.8	421.2
2010 ^p	25.5	10.1%	124.9	49.3%	0.0	0.0%	30.3	12.0%	72.8	28.7%	253.5	415.9

^a Renewables includes wood/biomass, solar, wind and biogas.

^b Includes energy resources (and losses) attributable to electricity generation.

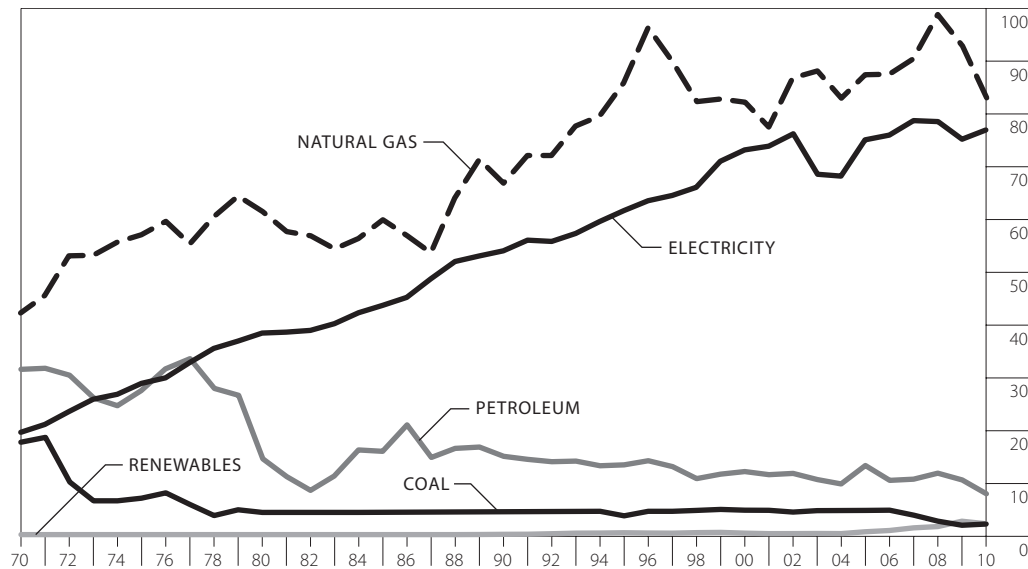
^p Preliminary estimates.

^r Revised due to revisions in contributing tables.

Source: Compiled from tables in this publication for Wisconsin petroleum, natural gas, coal, renewables and electricity use, by economic sector, and for Wisconsin electric utility energy use.

Wisconsin Commercial Energy Use, by Type of Fuel

1970-2010 TRILLIONS OF BTU



1970-2010 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Petroleum		Natural Gas		Coal		Renewables ^a		Electricity		Total End Use	Total Resource ^b
1970	31.5	28.3%	42.2	38.0%	17.7	15.9%	0.2	0.2%	19.6	17.6%	111.2	149.3
1975	27.5	22.8%	57.0	47.2%	7.1	5.9%	0.2	0.2%	28.8	23.9%	120.6	182.0
1980	14.6	12.3%	61.4	51.6%	4.4	3.7%	0.2	0.2%	38.4	32.3%	119.0	198.5
1985	16.0	12.9%	59.8	48.2%	4.4	3.6%	0.2	0.2%	43.6	35.2%	124.0	216.5
1990	15.0	10.7%	66.7	47.5%	4.5	3.2%	0.3	0.2%	54.0	38.4%	140.4	270.8
1995	13.4	8.1%	85.8	52.0%	3.8	2.3%	0.6	0.3%	61.6	37.3%	165.1	312.8
2000	12.1	7.0%	82.1	47.6%	4.8	2.8%	0.5	0.3%	73.1	42.3%	172.6	338.9
2005	13.3	7.3%	87.3	48.2%	4.8	2.6%	0.7	0.4%	75.0	41.4%	181.1	342.4
2006	10.5	5.8%	87.4	48.7%	4.8	2.7%	1.0	0.5%	75.9	42.3%	179.6	336.3
2007	10.7	5.8%	90.3	48.8%	3.9	2.1%	1.5	0.8%	78.6	42.5%	185.0	361.3
2008	11.8	6.1%	98.6	51.0%	2.7	1.4%	1.7	0.9%	78.4	40.6%	193.3	370.4
2009 ^r	10.6	5.8%	92.8	50.7%	2.0	1.1%	2.7	1.5%	75.1	41.0%	183.1	350.2
2010 ^p	8.0	4.6%	83.0	48.2%	2.2	1.3%	2.3	1.3%	76.8	44.6%	172.2	343.7

^a Renewables includes solar, wood, biomass, wind, hydro and biogas.

^b Includes energy resources (and losses) attributable to electricity generation.

^p Preliminary estimates.

^r Revised due to revisions in contributing tables.

Source: Compiled from tables in this publication for Wisconsin petroleum, natural gas, coal, renewables and electricity use, by economic sector, and for Wisconsin electric utility energy use.

COMMERCIAL
END-USE
ENERGY
5.9%
IN 2010

In 2010, commercial sector end-use energy decreased 5.9 percent. Since 1980, commercial end-use energy has increased 44.8 percent. Electricity energy use doubled (100.2 percent) over the same period. The commercial sector saw increases in electricity use (2.4 percent) and coal (11.6 percent), and decreases in petroleum (24.7 percent), natural gas (10.6 percent) and renewables (17.7 percent). Natural gas remains the major energy source, providing 48.2 percent of commercial sector energy, followed by electricity at 44.6 percent. Electricity use in this sector increased 292.4 percent since 1970. Petroleum's importance in this sector has declined from consuming 28.3 percent of the energy used in 1970, to presently accounting for only 4.6 percent of total commercial energy consumption.

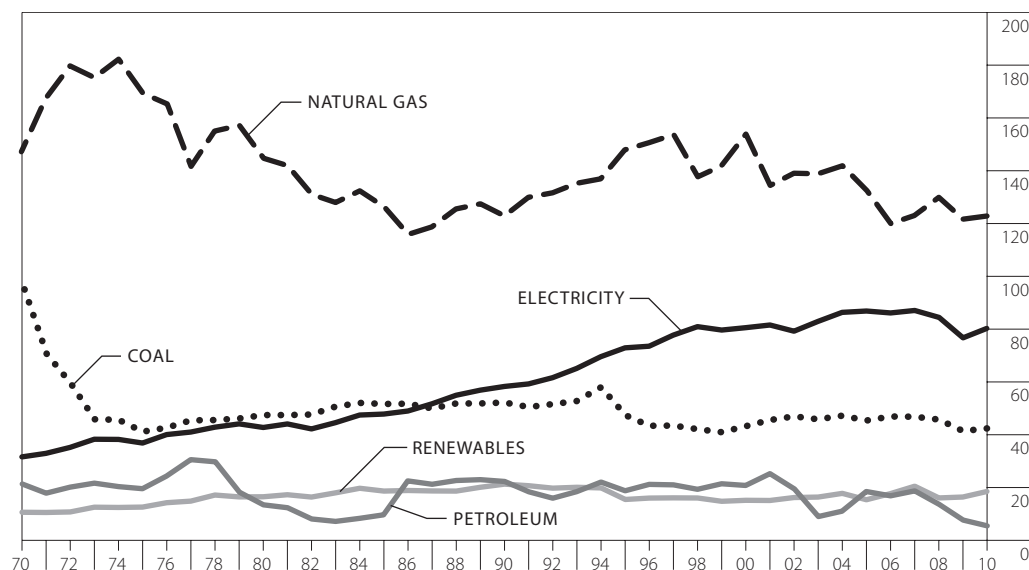
Wisconsin Industrial Energy Use, by Type of Fuel

**INDUSTRIAL
END-USE
ENERGY
2.2%
IN 2010**

End-use energy consumption in the industrial sector increased 2.2 percent in 2010, following a decrease of 9.0 percent in 2009. The major industrial energy sources are natural gas (45.7 percent) and electricity (29.8 percent), trailed by coal (15.7 percent), renewables (6.8 percent) and petroleum (2.0 percent).

While petroleum continues to be the largest end-use energy source in Wisconsin, in the industrial sector petroleum comprises the smallest amount of energy use by fuel. Use of all fuels in the industrial sector increased, with the exception of petroleum which declined by 29.3 percent. The increases, by fuel, are: natural gas, 1.0 percent; coal, 2.5 percent; renewables, 13.0 percent; and electricity, 4.7 percent.

1970-2010 TRILLIONS OF BTU



1970-2010 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Petroleum		Natural Gas		Coal		Renewables ^a		Electricity		Total End Use	Total Resource ^b
1970	21.1	6.9%	147.1	47.9%	97.1	31.6%	10.4	3.4%	31.4	10.2%	307.0	368.0
1975	19.3	6.9%	169.1	60.8%	40.9	14.7%	12.3	4.4%	36.6	13.2%	278.2	356.1
1980	13.2	5.0%	144.5	54.8%	47.2	17.9%	16.2	6.2%	42.5	16.1%	263.6	351.7
1985	9.4	3.7%	126.1	49.9%	51.4	20.3%	18.4	7.3%	47.6	18.8%	252.9	353.7
1990	22.1	8.0%	122.6	44.5%	51.9	18.8%	21.0	7.6%	58.0	21.1%	275.7	416.0
1995	18.5	6.1%	147.7	49.0%	47.2	15.7%	15.2	5.1%	72.7	24.1%	301.3	475.6
2000	20.5	6.6%	153.4	49.1%	43.0	13.8%	14.9	4.8%	80.3	25.7%	312.1	494.9
2005	18.2	6.1%	132.3	44.5%	45.1	15.2%	15.1	5.1%	86.6	29.1%	297.4	483.7
2006	16.6	5.8%	119.7	41.8%	46.7	16.3%	17.4	6.1%	86.3	30.1%	286.7	465.0
2007	18.5	6.3%	122.8	41.6%	46.6	15.8%	20.2	6.9%	86.8	29.4%	294.9	489.6
2008 ^r	13.4	4.6%	129.6	44.9%	45.5	15.8%	15.8	5.5%	84.2	29.2%	288.5	478.6
2009 ^r	7.4	2.8%	121.4	46.2%	41.1	15.7%	16.2	6.2%	76.4	29.1%	262.5	432.5
2010 ^p	5.3	2.0%	122.6	45.7%	42.1	15.7%	18.3	6.8%	80.0	29.8%	268.3	446.9

^a Renewables includes hydro, wood, wind, biogas and biomass.

^b Includes energy resources (and losses) attributable to electricity generation.

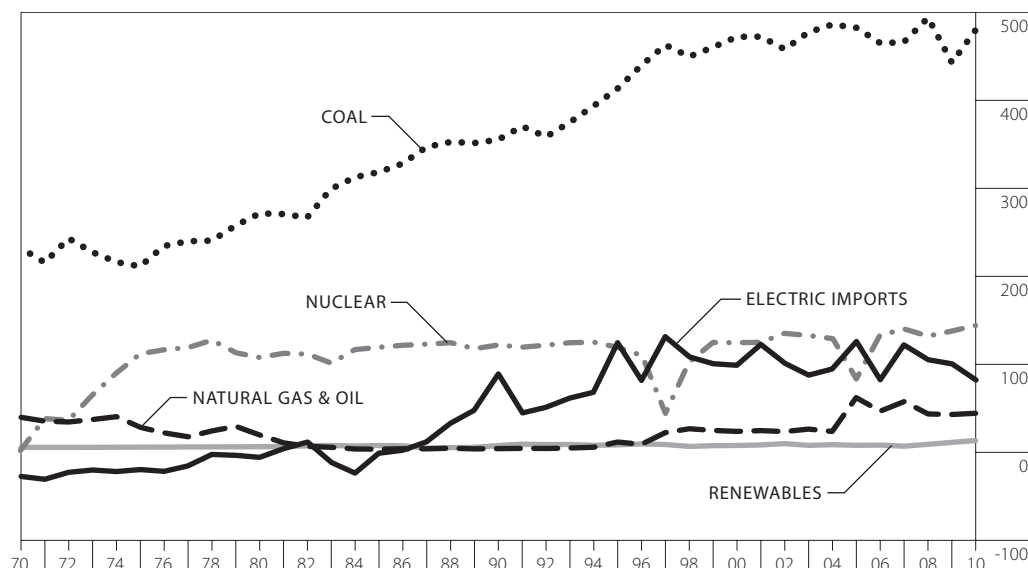
^p Preliminary estimates.

^r Revised due to revisions in contributing tables.

Source: Compiled from tables in this publication for Wisconsin petroleum, natural gas, coal, renewables and electricity use, by economic sector, and for Wisconsin electric utility energy use.

Wisconsin Energy Use for Electricity Generation, in Btu, by Type of Fuel

1970-2010 TRILLIONS OF BTU



1970-2010 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Petroleum	Natural Gas	Coal ^a	Renewables	Nuclear ^b	Electric Imports ^c	Hydro	Total
1970	7.9 3.2%	31.1 12.5%	231.1 93.0%	4.8 1.9%	1.7 0.7%	-28.2 -11.4%	4.8 1.9%	248.4
1975	7.8 2.3%	19.8 5.9%	210.5 63.0%	5.1 1.5%	111.2 33.3%	-20.4 -6.1%	5.1 1.5%	333.9
1980	4.8 1.2%	14.1 3.6%	270.7 68.4%	5.6 1.4%	107.0 27.0%	-6.5 -1.6%	5.6 1.4%	395.8
1985	1.4 0.3%	1.4 0.3%	317.7 71.5%	7.0 1.6%	118.6 26.7%	-1.8 -0.4%	7.0 1.6%	444.2
1990	1.0 0.2%	2.4 0.4%	354.5 61.8%	6.9 1.2%	121.2 21.1%	87.7 15.3%	6.1 1.1%	573.7
1995	0.8 0.1%	10.1 1.5%	412.4 61.3%	7.7 1.1%	118.5 17.6%	123.0 18.3%	7.2 1.1%	672.5
2000	1.6 0.2%	21.4 3.0%	471.4 65.2%	7.0 1.0%	123.8 17.1%	98.1 13.6%	6.0 0.8%	723.3
2005	1.8 0.2%	59.4 7.9%	481.7 63.7%	7.2 1.0%	81.8 10.8%	124.7 16.5%	5.1 0.7%	756.6
2006	1.4 0.2%	44.5 6.1%	464.1 63.5%	7.4 1.0%	132.1 18.1%	81.0 11.1%	4.9 0.7%	730.5
2007	1.9 0.2%	54.9 7.0%	465.4 59.0%	6.2 0.8%	139.4 17.7%	121.3 15.4%	4.5 0.6%	789.1
2008	1.1 0.1%	41.7 5.3%	492.6 63.2%	8.3 1.1%	131.3 16.8%	104.7 13.4%	4.9 0.6%	779.7
2009 ^r	0.6 0.1%	41.6 5.7%	441.4 60.5%	10.5 1.4%	137.0 18.8%	98.5 13.5%	4.6 0.6%	729.6
2010 ^p	0.5 0.1%	43.1 5.7%	478.7 63.1%	12.6 1.7%	143.4 18.9%	80.1 10.6%	6.9 0.9%	758.4

^a Includes petroleum coke.

^b Based on 10,800 Btu per kWh.

^c Estimated assuming 11,300 Btu of resource energy per kWh imported into Wisconsin. Numbers in parentheses and negative percentages indicate resource energy used in Wisconsin to produce electricity that was exported.

^p Preliminary estimates.

^r Revised.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Statistics of Wisconsin Public Utilities*, Bulletin #8 (1970-1994); U.S. Department of Agriculture, Rural Electrification Administration, *Annual Statistical Report*, REA Bulletin 1-1 (1970-1995); Wisconsin Department of Natural Resources, *Annual Survey of Point Source Emissions*, unpublished (1971-2010); American Gas Association, *Gas Facts* (1970-1995); U.S. Department of Energy, Energy Information Administration, *Electric Power Monthly*, [DOE/EIA-0226(2012/02)] (February 2012); Public Service Commission of Wisconsin, unpublished data (2005-2010); survey of wastewater treatment facilities and landfills on biogas production (2007-2010).

ENERGY USE
FOR ELECTRIC
GENERATION
3.9%
IN 2010

Wisconsin's energy use for electric generation increased by 3.9 percent in 2010. Since the early 1980s, coal and nuclear power have been dominate fuels for electricity generation.

Coal use increased 8.5 percent and imports of electricity (and associated losses) from other states and Canada decreased 18.7 percent. Petroleum use decreased by 10.5 percent while natural gas increased by 3.6 percent. In 2010, of the electricity produced in Wisconsin, coal provided 63.1 percent of the energy. The proportion of energy provided by petroleum, natural gas, renewables and hydropower was only 8.5 percent, and the balance of electricity was nuclear (18.9 percent) or imports to the state (10.6 percent).

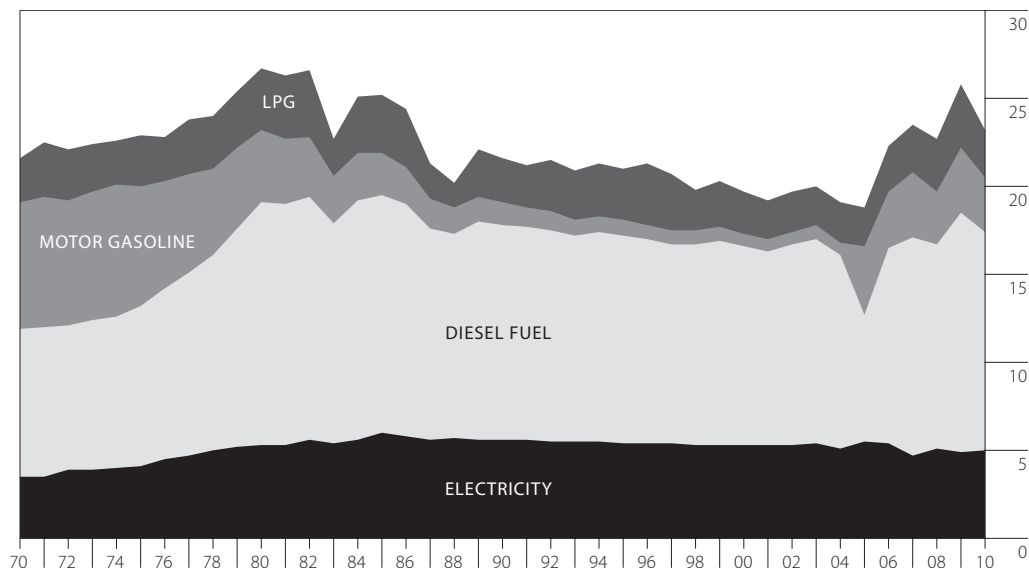
Wisconsin Agricultural Energy Use, in Btu, by Type of Fuel

AGRICULTURAL
END-USE
ENERGY
7.7%
IN 2010

Agricultural energy end-use decreased 7.7 percent in 2010. Energy use in this sector is affected by changes in mechanization and automation, and by advances in technology such as biodiesel. Agricultural sector energy use accounted for 2.1 percent of total end-use energy in Wisconsin.

Starting in 2005, figures in this table reflect a shift from a per acre approach to gathering fuel data to new data resources for petroleum fuels. Previous to 2005, distillate and kerosene data were included in the diesel figure.

1970-2010 TRILLIONS OF BTU



1970-2010 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Motor Gasoline	Diesel Fuel ^a	LPG	Other Fuel ^b	Total Petroleum	Electricity	Total End Use	Total Resource Use ^c
1970	7.2	8.4	2.5		18.1	3.5	21.6	28.4
1975	6.8	9.1	2.9		18.8	4.1	22.9	31.7
1980	4.1	13.8	3.5		21.4	5.3	26.7	37.5
1985	2.4	13.5	3.3		19.2	6.0	25.1	37.8
1990	1.3	12.2	2.5		16.0	5.6	21.6	35.2
1995 ^r	0.9	11.8	2.9		15.6	5.4	21.0	34.1
2000	0.7	11.3	2.4		14.4	5.3	19.7	31.8
2005	3.9	7.2	2.2	0.3	13.6	5.5	19.0	30.8
2006	3.2	11.1	2.6	0.3	17.2	5.4	22.6	33.7
2007	3.7	12.4	2.7	0.3	19.0	4.7	23.7	34.3
2008 ^r	3.0	11.6	3.0	0.3	17.9	5.1	23.0	34.4
2009	3.7	13.6	3.6	0.7	21.6	4.9	26.5	37.5
2010 ^p	3.1	12.4	2.7	0.2	18.4	5.0	23.4	34.6

^a Includes other light distillates, through 2005.

^b This fuel is primarily distillate and kerosene, but may include small amounts of coal and wood.

^c Includes energy resources (and losses) attributed to electricity generation.

^p Preliminary estimates.

^r Revised.

Source: Wisconsin Department of Administration, Division of Energy, based on U.S. Department of Agriculture, *Energy and U.S. Agriculture: 1974 Data Base* (September 1976), *1978 Census of Agriculture* (1980) and *Farm Production Expenditures* (1980-1984); Wisconsin Department of Agriculture, Trade, and Consumer Protection, *Wisconsin Agricultural Statistics* (1974-2009) and *Wisconsin Dairy Facts* (1982-2006); Wisconsin Department of Revenue, *Fuels sales and tax data* (1991-2010); National Agriculture Statistics Service, unpublished expenditure data (2005-2010); United States Department of Agriculture, Economic Research Service data, <http://www.ers.usda.gov/data-products/farm-income-and-wealth-statistics.aspx> (2005-2010); Energy Information Administration, *petroleum navigator* (2005-2010).

Wisconsin Agricultural Energy Use, in Gallons and kWh, by Type of Fuel

1970-2010 MILLIONS OF GALLONS AND MILLIONS OF kWh

Year	Motor Gasoline	Diesel ^a	LPG	Other Fuel ^b	Total Petroleum	Electricity (Millions of kWh)
1970	58.0	60.7	0.1		118.8	1,028
1975	54.3	65.8	0.1		120.2	1,210
1980	33.0	99.3	0.1		132.4	1,539
1985	19.1	97.8	0.1		117.0	1,745
1990	10.1	88.5	0.1		98.7	1,645
1995	6.9	85.0	0.1		92.0	1,595
1996	6.3	84.0	36.8		127.1	1,585
1997	6.1	81.9	33.1		121.1	1,575
1998	6.0	82.2	24.2		112.4	1,565
1999	6.1	83.7	27.6		117.4	1,560
2000	5.8	81.4	25.3		112.5	1,555
2001	5.7	79.5	23.5		108.7	1,550
2002	5.8	82.1	24.0		111.9	1,545
2003	6.0	84.1	22.8		112.9	1,595
2004	5.8	81.2	24.1		111.1	1,501
2005 ^r	31.2	52.1	22.6	1.9	107.9	1,606
2006 ^r	25.9	80.0	27.1	2.2	135.2	1,574
2007 ^r	29.6	89.1	28.3	1.9	149.0	1,379
2008	23.6	83.9	31.8	2.0	141.3	1,486
2009 ^r	29.5	98.1	37.8	4.8	170.3	1,443
2010^p	24.8	89.3	28.7	1.7	144.5	1,463

^a Fuel oil and kerosene, through 2004.

^b This fuel is primarily distillate and kerosene, but may include small amounts of coal and wood.

^p Preliminary estimates.

^r Revised.

Source: Wisconsin Department of Administration, Division of Energy, based on U.S. Department of Agriculture, *Energy and U. S. Agriculture: 1974 Data Base* (September 1976), *1978 Census of Agriculture* (1980) and *Farm Production Expenditures* (1980-1984); Wisconsin Department of Agriculture, Trade, and Consumer Protection, *Wisconsin Agricultural Statistics* (1974-2009) and *Wisconsin Dairy Facts* (1982-2006); and Wisconsin Department of Revenue fuels sales and tax data (1991-2010); National Agriculture Statistics Service, unpublished expenditure data (2005-2010); United States Department of Agriculture, Economic Research Service data, <http://www.ers.usda.gov/data-products/farm-income-and-wealth-statistics.aspx> (2005-2010); Energy Information Administration, petroleum navigator (2005-2010).

Although farmers use manure digesters and other forms of energy generation such as biomass, and biodiesel to power and heat their farm, their primary energy comes from petroleum sources.

The State Energy Office instituted a new method of data collection for fuels used in the agricultural sector. Starting in 2005, agricultural sector data have been revised to reflect the new data collection method.

Previous to 2005, kerosene and distillates were included in the diesel figure.

Wisconsin Transportation Energy Use, in Btu, by Type of Fuel

TRANSPORTATION ENERGY USE

3.7%

MOTOR GASOLINE USE

1.6%

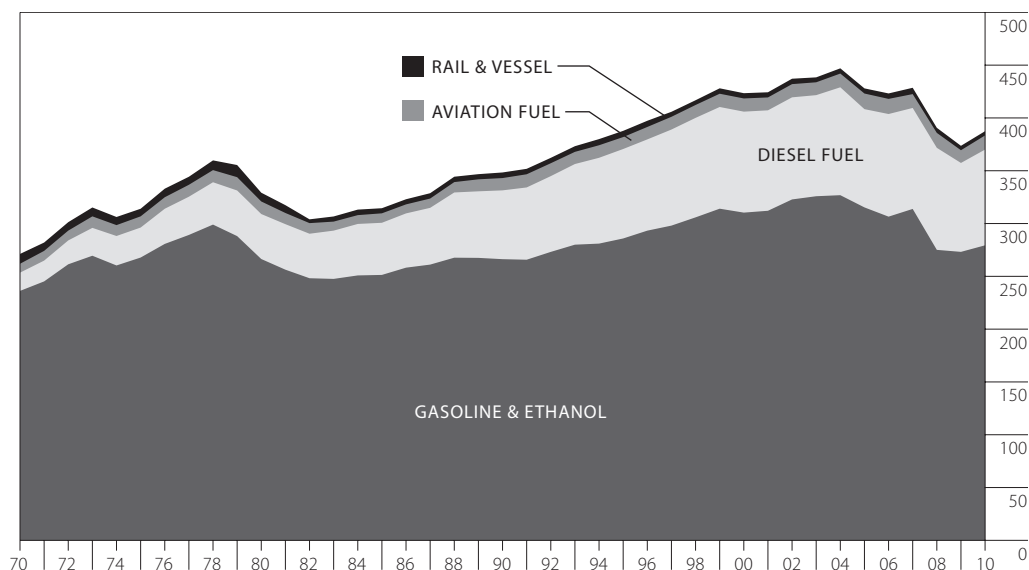
ETHANOL USE

10.7%

Transportation energy use increased 3.7 percent in 2010. Motor gasoline use increased 1.6 percent, while ethanol use increased 10.7 percent.

Diesel fuel is used primarily for trucking freight. Diesel fuel use increased 7.7 percent. Transportation activities consume 35.1 percent of Wisconsin's total end-use energy, accounting for 86.4 percent of petroleum use.

1970-2010 TRILLIONS OF BTU



Year	Motor Gasoline ^a	Ethanol	Diesel Fuel	Aviation		Rail Distillate & Residual	LPG	Total ^b
				Gasoline	Jet Fuel			
1970	236.2	0.0	17.3	0.7	7.7	9.3	NA	271.2
1975	267.8	0.0	28.4	0.8	9.8	7.2	NA	314.0
1980	266.4	0.0	42.6	0.9	11.0	8.3	NA	329.2
1985 ^r	251.2	0.1	49.4	0.6	8.4	4.8	NA	314.5
1990	265.6	0.7	65.2	0.6	11.0	5.4	NA	348.4
1995 ^r	281.8	4.1	84.7	0.7	10.6	5.9	0.6	388.3
2000 ^r	302.4	7.9	95.6	0.8	11.7	5.0	0.5	423.9
2005	304.9	10.4	93.1	0.5	14.3	4.9	0.3	428.3
2006	295.5	11.0	97.2	0.4	13.9	5.2	0.3	423.5
2007	300.2	13.6	95.6	0.4	12.8	6.0	0.2	428.8
2008 ^r	256.7	18.3	96.6	0.3	13.8	4.8	0.2	390.9
2009	253.8	19.4	84.2	0.3	11.8	4.2	0.2	373.8
2010 ^p	257.9	21.5	90.7	0.3	13.1	4.0	0.2	387.7

^a Excludes ethanol.

^b Since 1994, fewer than .05 trillion Btu of compressed natural gas (CNG) were used for highway transportation.

^p Preliminary estimate.

^r Revised.

NA – Not available.

Source: Wisconsin Department of Commerce, Bureau of Petroleum Inspection, *Report on Petroleum Products Inspected and Delivered to Wisconsin* (1970-1995); Wisconsin Department of Revenue, *Motor Vehicle Fuel Tax Statistics* (1970-2010) and *Petroleum Supply Annual*, DOE/EIA-3340 (1982-2010); US Department of Energy, Form EIA-782C, "Monthly Report of Petroleum Products Sold for Consumption" (1983-2010); WI State Energy Office surveys of airport fixed base operators (2007-2009) and railways (2007-2010).

Wisconsin Transportation Energy Use, in Gallons, by Type of Fuel

1970-2010 MILLIONS OF GALLONS

Year	Motor Gasoline ^a	Ethanol	Diesel Fuel	Aviation		Distillate & Residual		LPG	Total ^b
				Gasoline	Jet Fuel	Rail	Vessel		
1970	1,889.1	0.0	124.8	5.9	56.7	49.2	17.0	NA	2,142.7
1975	2,142.8	0.0	205.1	6.7	72.4	36.6	14.1	NA	2,477.7
1980	2,130.7	0.0	307.1	7.0	81.4	44.8	14.8	NA	2,585.8
1985	2,009.7	1.5	356.9	4.5	62.2	27.1	7.4	NA	2,469.3
1990	2,124.5	8.3	471.1	5.0	81.6	29.1	9.0	NA	2,728.6
1995	2,254.1	48.5	612.5	5.6	78.6	35.1	6.9	6.1	3,047.3
1996	2,307.8	56.8	624.6	5.7	82.0	38.4	3.7	6.0	3,125.0
1997	2,345.4	57.5	657.6	5.8	84.0	34.1	0.0	5.8	3,190.3
1998	2,398.4	71.5	681.0	5.9	85.0	31.9	0.5	5.7	3,280.0
1999	2,461.5	75.4	696.3	6.1	87.4	37.0	0.0	5.1	3,368.8
2000	2,419.4	93.8	691.2	6.0	87.0	35.9	0.0	5.3	3,338.6
2001	2,438.6	85.9	687.7	5.9	85.0	35.2	0.0	4.6	3,342.9
2002	2,523.0	88.2	698.9	4.9	88.2	36.9	0.0	4.0	3,444.1
2003	2,538.7	100.9	692.1	4.3	86.1	33.7	0.0	3.8	3,459.6
2004	2,545.6	102.5	738.5	4.2	92.5	35.7	0.0	3.7	3,522.7
2005	2,439.2	123.0	672.7	4.1	105.7	35.1	0.0	3.0	3,382.8
2006	2,364.1	130.4	702.6	3.5	102.9	37.2	0.0	3.2	3,343.9
2007	2,401.7	161.2	691.3	2.8	94.6	43.2	0.0	2.3	3,397.2
2008 ^r	2,054.0	217.0	698.6	2.6	102.4	34.7	0.0	2.5	3,111.8
2009 ^r	2,030.3	229.7	608.7	2.4	87.0	30.1	0.0	2.2	2,990.5
2010 ^p	2,063.2	254.3	655.5	2.4	97.0	28.9	0.0	2.2	3,103.7

AVERAGE
PRICE OF
GASOLINE
\$.417
PER GALLON

In 2010, the average statewide price of gasoline increased by \$.417 a gallon, to \$2.791 a gallon.

Ethanol, a renewable energy resource primarily distilled from corn, is used as an oxygenate in reformulated gasoline and in the blending of E10 (10 percent ethanol, 90 percent gasoline) and E85 (85 percent ethanol, 15 percent gasoline).

The increased use of ethanol is also linked to the increased availability of ethanol statewide.

^a Excludes ethanol. See adjacent column for amounts of ethanol.

^b In 2010, 302.0 thousand gasoline gallon equivalents (GGEs) of compressed natural gas, and 2,262.2 thousand GGEs of liquefied propane gas were used for highway transportation.

^p Preliminary estimate.

^r Revised.

NA – Not available.

Source: Wisconsin Department of Commerce, Bureau of Petroleum Inspection, *Report on Petroleum Products Inspected and Delivered to Wisconsin* (1970-1995); Wisconsin Department of Revenue, *Motor Vehicle Fuel Tax Statistics* (1970-2010) and *Petroleum Supply Annual*, DOE/EIA-3340 (1982-2010); US Department of Energy, Form EIA-782C, "Monthly Report of Petroleum Products Sold Into States for Consumption" (1983-2010); WI State Energy Office surveys of airport fixed base operators (2007-2009) and railways (2007-2010).